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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

TESKIN, FRED M

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/561,165	Applicant(s) DE JONG ET AL.	
	Examiner Fred M. Teskin	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20051216; 20060302</u> . | 6) <input type="checkbox"/> Other: ____. |

Detailed Action

This Office action is responsive to application filed 31 January 2006. The preliminary amendment of 16 December 6, 2005 has been entered. Claims 1-14 are currently pending and under examination.

The disclosure is objected to because of the following informalities: (I) the absence of section headings in accord with Rule 77(b); (II) the presence of an embedded figure (Figure 1 on p. 21) in violation of Rule 58(a) (which states the specification shall not contain drawings) and (III) the absence of a brief description of the drawing as per Rule 74.

Appropriate correction is required.

Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More specifically, the following grounds for indefiniteness apply to the indicated claims.

Regarding claims 1, 6, 7 and 11, a broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is

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followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. In the present instance, claim 1 recites the broad recitation "ethylenically unsaturated organic compounds" and "solubility of the peroxydicarbonate(s) ... is at least 5 ppm" and the claim also recites "preferably cannot homopolymerize" and "solubility of all organic peroxides ... is at least 5 ppm," which are respectively narrower statements of the range/limitation. Similar instances of recitation of a broad range/limitation followed by a linking term (e.g., "preferably", "more preferably", "most preferably", "more particularly") and then a narrower statement of the range/limitation are found in each of claims 6, 7 and 11.

Regarding claim 14, the phrase "it does not relate to a formulation comprising..." is vague and indefinite as there is uncertainty as to what relationship(s) between the two recited formulations are intended to be precluded. It is unclear, for instance, whether the phrase is intended to limit the claim to formulations void of both a peroxide and a phlegmatizing agent as defined in the final seven lines of the claim. Clarification at least by way of explanation is required.

Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The expression “(Co)polymer obtainable by a process of claim 1...” renders claim 12 indefinite because almost any variation in any parameter within the scope of the claimed process would alter the (co)polymer produced. In consequence, one who made or used a (co)polymer made by a process other than the process recited in the parent claim would have to produce (co)polymers using all possible parameters within the scope of claim 1 – a practical impossibility – and then extensively analyze each product to determine if his (co)polymer was obtainable by a process within the claimed process. A claim is indefinite if undue experimentation is involved to determine the boundaries of protection. *Ex parte Tanksley*, 26 USPQ2d 1389. This rationale is applicable to the present case in view of the extensive testing that would be involved in ascertaining whether a (co)polymer made by a process different to that claimed is nevertheless obtainable by the claimed process.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4, 6-8, 10, 11 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by US 3778422 to Farber et al ("Farber").

Farber has described an aqueous suspension polymerization process for preparing vinyl chloride polymer, wherein a mixture of di-sec-butyl peroxydicarbonate or di-isopropyl peroxydicarbonate and tert-butyl hydroperoxide were used as polymerization initiators; see Examples 1 and 2. In Example 1, di-sec-butyl peroxydicarbonate and tert-butyl hydroperoxide were used in amounts 0.0361 part and 0.0018 part, respectively, which equates to 4.9 wt% of the latter, based on weight of the organic (peroxydicarbonate) initiator; and in Example 2, 0.3 wt% of t-butyl hydroperoxide was used, based on the weight of di-isopropyl peroxydicarbonate (see col. 4, ll. 47-50). Each weight percentage qualifies as an "effective amount" of organic hydroperoxide as that term is defined by applicants (i.e., typically, 0.3-45 wt%; see p. 8 of Specification). Further, the peroxydicarbonates used in these examples are species

under applicants' formula (III) in that the alkyl moieties (sec-butyl, isopropyl) each contain at most 4 carbon atoms (*cf.*, claim 8). The chemically identical species of organic peroxide used in Farber are reasonably presumed to inherently meet the solubility limitation for peroxydicarbonate(s) as recited in present claim 1, as well as the half-life requirements of claims 4 and 11. Where, as here, the prior art teaches the identical chemical composition as claimed, the properties applicants disclose and/or claim are necessarily present therein, *In Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Further as to claim 12, the polymer product obtained per Example 1 or 2 of Farber is considered a (co)polymer within the scope of claim 12, in view of the identity of process parameters.

As such, Farber is seen to describe an embodiment of applicants' process with sufficient specificity as to render the indicated claims anticipated.

Claims 1, 4-6, 8, 11 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by US 3451985 to Mahlo.

Mahlo has described an aqueous suspension polymerization process for preparing vinyl chloride polymer, wherein a charge of 0.4 part of di-isopropyl peroxydicarbonate initiator and diethyl maleate solvent were slowly fed to the high pressure line leading to the polymerization reactor, see Example 1. Diethyl maleate is a species of stabilizing additive within claim 1, in that the expression "unsaturated organic compounds that preferably cannot homopolymerize" is defined by applicants as inclusive of dialkyl maleates (per Specification at p. 7, first line) and Mahlo identifies

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diethyl maleate as a suitable solvent to "stabilize the initiator against decomposition" (col. 2, ll. 35-39). Moreover, it is noted that di-isopropyl peroxydicarbonate is a species under applicants' formula (III) in that the isopropyl moieties each contain 3 carbon atoms (*cf.*, claim 8). The chemically identical species of organic peroxide used in the aqueous suspension polymerization exemplified in Mahlo is reasonably presumed to inherently meet the solubility limitation for peroxydicarbonate(s) as recited in present claim 1, as well as the half-life requirements of claims 4 and 11. As such, Mahlo is seen to describe an embodiment of applicants' process with sufficient specificity as to render the indicated claims anticipated.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mahlo as applied to claim 1 above, and further in view of US 3022282 to Marous et al ("Marous").

Mahlo describes in Example 1 a process wherein the described charge is "slowly fed" to the high pressure line of the polymerization reactor. This process is seen to qualify as one in which the stabilizing additive (diethyl maleate) is "dosed" to the polymerization process in the form of a composition comprising a peroxydicarbonate initiator within claim 1. Unfortunately, the composition lacks an additional organic peroxide as recited in claim 10, e.g., diacyl peroxides. However, Mahlo suggests employing other polymerization initiators in connection with the dialkyl peroxydicarbonates and acyl persulfonate initiators described therein (col. 3, line 71 to col. 4, line 2). Marous in analogous art teaches that the use of a combination of a

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peroxy dicarbonate ester with an organic peroxide such as benzoyl peroxide and lauroyl peroxide allows for effective use of a lower amount of the diisopropyl ester when undertaking aqueous suspension polymerization of vinyl chloride monomer (Marous: col. 1, ll. 50+ and col. 3, ll. 26-31). Use of conventional catalysts in combination with the peroxy dicarbonate catalysts is said to be particularly important when making lower molecular weight polyvinyl chloride resins which otherwise cannot be carried to a commercially feasible conversion (Marous: col. 6, ll. 25-30). It would have been obvious to one of ordinary skill in the art at the time of the invention to include in the initiator charge in Mahlo a diacyl peroxide such as benzoyl or lauroyl peroxide in the expectation of realizing an improvement in monomer conversion consistent with the teachings of Marous.

Claims 1, 4, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5892090 to Frenkel.

Frenkel has disclosed compositions containing an organic peroxide compound and one or more oximes in an amount effective to achieve stabilization, i.e., to prevent decomposition of the peroxide compound (col. 2, ll. 1-13). Example 2 describes a composition of di-sec-butyl peroxydicarbonate stabilized with acetaldoxime (see Table IV, final entry). As di-sec-butyl peroxydicarbonate is species of organic peroxide under applicants' formula (III), the cited composition is reasonably presumed to inherently possess the instantly claimed properties of solubility (claim 1) and half-life period (claims 4, 11) which are not explicitly disclosed by Frenkel. Frankel lacks a specific

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disclosure of using this composition in an aqueous dispersion polymerization, this being the essential difference from claims 1, 4, 11 and 12. Such utility is, however, expressly suggested by the teaching of applicability of the Frenkel invention to aqueous dispersions of peroxydicarbonates that useful as initiators in the free radical polymerizations of ethylenically unsaturated materials, particularly in an aqueous medium, e.g., suspension or emulsion polymerization (col. 3, ll. 56+) and by the statement therein that "the oxime does not detract from the effectiveness of the peroxide as a polymerization initiator" (col. 5, ll. 3-4). Therefore, it would have been obvious to one of ordinary skill in the art to use the disclosed composition of di-sec-butyl peroxydicarbonate and acetaldoxime in an aqueous dispersion polymerization process as per instant claim 1, in order to take advantage of the stabilizing effect of the oxime while retaining the effectiveness of the peroxide initiator as taught by Frenkel.

Claims 1-4, 6, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6803436 to Waanders et al ("Waanders").

Waanders has disclosed organic peroxide formulations comprising reactive phlegmatizers, for use in polymerization processes (col. 3, ll. 12-25). The reactive phlegmatizer is more specifically described as selected from the group of compounds that react effectively in the polymerization process but do not encompass regular monomers as used in radical homopolymerization processes (col. 3, ll. 45-46; col. 5, ll. 16-19); most preferred is the use of α -methylstyrene and/or (cyclic) olefins (col. 5, ll. 42-43). Example 1 describes a formulation comprising t-butylperoxy 2-ethylhexanoate and

1-octene. The latter is a species of stabilizing additive within claim 1, in that the expression "unsaturated organic compounds that preferably cannot homopolymerize" is defined by applicants as inclusive of α -olefins (per Specification at p. 7, first line), while the former is a species under applicants' formula (II) (*cf.*, claim 8). This chemically identical species of organic peroxide is reasonably presumed to inherently meet the solubility limitations as recited in present claims 1-2, as well as the half-life requirements of claims 4 and 11. As such, Waanders differs from the claimed invention in failing to specifically disclose use of the formulation of Example 1 in an aqueous dispersion polymerization process. However, Waanders expressly suggests utility of the disclosed formulations in a conventional suspension polymerization of, e.g., styrene or vinyl chloride (see col. 3, ll. 21-22; col. 6, ll. 29-34 and col. 8, ll. 15-20). Therefore, it would have been obvious to use the formulation disclosed in Example 1 of Waanders in a conventional aqueous dispersion polymerization, and thereby arrive at a process within claims 1-4, 6 and 11, from which a (co)polymer as per claim 12 would be obtained.

Claim 12 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over either of US 5096988 ("Amano I") and US 5478900 ("Amano II").

Claim 12 is drawn to (co)polymer "obtainable" by the process of claim 1. Applicants indicate that the instant process results in (co)polymer with reduced levels of fish eyes at high initiator loads (Specification, p. 2). The cited documents each describe vinyl chloride polymers characterized by a small number of fish eyes in a mill-rolled

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sheet specimen; e.g., 0-5 fish eyes in a rolled product as reported in Examples 1-4 of Amano I and Examples 1-2 (Table 1) of Amano II. Applicants' fish eye level counts are likewise made on the basis of a roll-milled sheet per the procedure detailed on page 19 of the Specification. Like the instantly claimed (co)polymer, the products of said examples were obtained by polymerization in the presence of an organic peroxide (peroxydicarbonate) initiator although the procedure differs from applicants' process in that a stabilizing additive was not used. Nevertheless, the similarity in the mutually disclosed property and the identity of polymer composition provide a plausible basis for concluding that the cited products of Amano I and Amano II are the same as, or insubstantially different from, (co)polymers embraced by claim 12. Thus the burden properly shifts to applicants to come forward with evidence establishing an unobvious difference between the claimed product and the prior art products. See, *In re Marosi*, 218 USPQ 195 (Fed. Cir. 1983) and MPEP 2113 (noting lesser burden of proof on the Office in making out a case of *prima facie* obviousness for product-by-process claims, because of their peculiar nature).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over CA 02198814.

CA '814 is directed to diacyl peroxide formulations having improved stability and reduced decomposition rate due to the presence of an effective amount of at least one free radical scavenger (Abstract; p. 2, ll. 13-18). Amounts of free-radical scavenger effective to reduce the rate of dibenzoyl peroxide (BPO) decomposition are described

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on page 6. Preferred free-radical scavengers are set forth on pages 3-5, and include maleate esters. A formulation comprising 55% BPO paste and dibutyl maleate is included in the samples presented in Table 1 (p. 10). Said formulation differs from the formulation of claim 13 only in that BPO comprises two phenyl groups instead of aralkyl moieties as per formula (I) in claim 8, which is incorporated via dependency in claim 13. However, diacyl peroxides contemplated by CA '813 are said to correspond to those of the general formula set out on page 3 thereof. According to that formula, the R group attached to each carbonyl carbon may be the same or different and is selected from substituted or unsubstituted aryl, aralkyl, alkyl and alkaryl, with the proviso that at least one said R groups contains a benzyl moiety. It would have been obvious to one of ordinary skill in the art to modify the disclosed composition comprising dibutyl maleate by substituting BPO by a diacyl peroxide corresponding to formula (I) as claimed, based on the motivation that CA '814 teaches the equivalency between benzoyloxy and acyl groups containing aralkyl moieties. The mere substitution of an equivalent (something equal in value of meaning, as taught by analogous prior art) is not an act of invention; where equivalency is known in the prior art, the substitution of one equivalent for another is not patentable (i.e., it would have been obvious). *In re Ruff*, 118 USPQ 343 (CCPA 1958).

Claim 14 is rejected under 35 U.S.C. 102(b) as anticipated by US 3787527 to Meyer et al ("Meyer").

Meyer is directed to a mixture of a perester and a tertiary hydroperoxide as setting catalyst for unsaturated polyester resins, the weight ratio of the perester to the tertiary hydroperoxide being from 90:10 to 10:90 (col. 2, ll. 9-14). Mixtures containing specific peresters corresponding to formula (II) in claim 14 together with t-butyl hydroperoxide are described, see Tables I and III. The described mixtures contain the requisite perester, such as tert-butyl peroctanoate (I) or tert-butyl perisononate (II), and t-butyl hydroperoxide (V) in weight ratios equating to weight percentages within the scope of "effective amount" (of organic hydroperoxide) in claim 14, as that term is defined by applicants (i.e., typically, 0.3-45 wt%; see p. 8 of Specification). See in particular the 80:20 and 90:10 mixture ratios of peroxy compound (I) or (II) to hydroperoxide (V) as described in Table I of Meyer. The disclosed mixtures also contain an accelerator compound which is not recited in claim 14. However, claim 14 is couched in open ("comprising") language and its preambular recitation as to "suitable ... use" merely identifies a future intended use for a formulation which is completely defined in the body of the claim. Therefore, claim 14 is broadly construed as readable on the disclosed mixtures containing an accelerator compound. And in any event, accelerator-free mixtures of the perester (II) and the hydroperoxide (V) also are disclosed by Meyer, see Table IV, final entry. The perester species of Meyer which are present in the disclosed peroxide mixtures in amounts within the ambit of applicants' "effective amount" would inherently function as "controlling agent", as claimed. Where the prior art teaches the identical chemical composition as claimed, the properties

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applicants disclose and/or claim are necessarily present therein, *In Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Brothman is cited as pertinent to the use of mixtures of benzoyl peroxide and tert-butyl hydroperoxide for polymerization of methyl methacrylate (note Examples 1-7). In all of the specifically disclosed mixtures the proportion of tert-butyl hydroperoxide is substantially greater than the amounts of organic hydroperoxide disclosed by applicants in support of the term "effective amount". Brothman is not found to teach or adequately suggest an amount of hydroperoxide within the present claims.

Claim 9 is deemed free of the prior art, and would be allowable if amended or rewritten to overcome the rejection under 35 U.S.C. 112 set forth in this Office action and to include all the limitations of the base claim and any intervening claim.

Any inquiry concerning this communication should be directed to Examiner F. M. Teskin whose telephone number is (571) 272-1116. The examiner can normally be reached on Monday through Thursday from 7:00 AM - 4:30 PM, and can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The appropriate fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Fred M Teskin/

Primary Examiner, Art Unit 1796

FMTeskin/03-19-09